AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listing of claims in the application:

Claims 1-30 **(cancelled without prejudice).**

Claim 31 (currently amended): A fabrication method for a semiconductor laser apparatus to be operated at a desired optical output power level from a source of electric drive power, the desired optical output power level being greater than 50 mW, the semiconductor laser apparatus having a semiconductor laminated structure formed on a substrate, the laminated structure including a lower cladding layer, an upper cladding layer, an active layer disposed between the lower and upper cladding layers, a front facet to output the laser beam, a back facet, and a cavity length between the front and back facets, the active layer being configured to generate light such that the apparatus provides optical output power at the front facet in response to the source of electric drive power, the fabrication method comprising:

acquiring a relationship of the electric drive power as a function of the cavity length and the optical output power level of the semiconductor laser apparatus, the relationship including cavity lengths greater than 1000 μm and optical output power levels greater than 50 mW;

determining a value of the cavity length from the acquired relationship such that the electric drive power is vicinal to a minimum for the desired optical output power level and such that the value of cavity length is greater than 1000 μm, the desired optical power level being greater than 50 mW; ~~and~~

forming a semiconductor laminated structure on a substrate, the step including the steps of forming a lower cladding layer over the substrate, forming an active layer over the lower cladding layer, and forming an upper cladding layer over the active layer; and

forming the semiconductor laser apparatus **from the semiconductor laminated structure such that it has a front facet, a back facet, and a cavity length between said facets, the cavity length** having the value of the cavity length determined by the cavity length determining step.

PAGE 5/34 * RCVD AT 3/3/2004 7:11:15 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:4154343947 * DURATION (mm-ss):15-42

Claim 32 **(original):** A fabrication method for a semiconductor laser apparatus according to claim 31, wherein an active layer forming a cavity with the cavity length has a strain multiple quantum well structure.

Claim 33 (currently amended): A fabrication method for a semiconductor laser apparatus to be operated at a desired optical output power level from a source of electric drive power, the desired optical output power level being greater than 50 mW, the semiconductor laser apparatus having a semiconductor laminated structure formed on a substrate, the laminated structure including a lower cladding layer, an upper cladding layer, an active layer disposed between the lower and upper cladding layers, a front facet to output the laser beam, a back facet, and a cavity length between the front and back facets, the active layer being configured to generate light such that the apparatus provides optical output power at the front facet in response to the source of electric drive power, the apparatus having a photoelectric conversion efficiency defined as the ratio of the optical output power to the electric drive power, the fabrication method comprising:

(a) acquiring a relationship of the photoelectric conversion efficiency as a function of the cavity length and the optical output power level of the semiconductor laser apparatus, the relationship including cavity lengths greater than 1000 μm and optical output power levels greater than 50 mW;

(b) determining a value of the cavity length from the acquired relationship such that the photoelectric conversion efficiency is vicinal to a maximum for the desired optical output power level and such that the value of the cavity length is greater than 1000 μm, the desired optical power level being greater than 50 mW; ~~and~~

(c) **forming a semiconductor laminated structure on a substrate, the step including the steps of forming a lower cladding layer over the substrate, forming an active layer over the lower cladding layer, and forming an upper cladding layer over the active layer; and**

(d) forming the semiconductor laser apparatus **from the semiconductor laminated structure such that it has a front facet, a back facet, and a cavity length between said**

PAGE 6/34 * RCVD AT 3/3/2004 7:11:15 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:4154343947 * DURATION (mm-ss):15-42

facets, the cavity length having the value of the cavity length determined by the cavity length determining step.

Claim 34 **(previously presented):** A fabrication method for a semiconductor laser apparatus according to Claim 33, wherein step (b) comprises:

obtaining, from the relationship acquired from step (a), an expression between cavity length and optical output power which describes combinations of cavity lengths and optical output power levels that make the photoelectric conversion efficiency maximal; and

determining the value of cavity length on the basis of the expression.

Claim 35 **(Original):** A fabrication method for a semiconductor laser apparatus according to claim 33, wherein an active layer forming a cavity with the cavity length has a strain multiple quantum well structure.

Claims 36-38 **(cancelled without prejudice).**

Claim 39 (currently amended): A fabrication method for a semiconductor laser apparatus to be operated at a desired optical output power level from a source of electric drive power, the semiconductor laser apparatus having a semiconductor laminated structure formed on a substrate, the laminated structure including a lower cladding layer, an upper cladding layer, an active layer disposed between the lower and upper cladding layers, a front facet to output the laser beam, a back facet, and a cavity length between the front and back facets, the upper cladding layer having an impurity carrier concentration, the active layer being configured to generate light such that the apparatus provides optical output power at the front facet in response to the source of electric drive power, the fabrication method comprising:

(a) acquiring a relationship of the electric drive power as a function of the impurity carrier concentration of the upper cladding layer and the optical output power level of the semiconductor laser apparatus;

PAGE 7/34 * RCVD AT 3/3/2004 7:11:15 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:4154343947 * DURATION (mm-ss):15-42

(b) determining a value of the impurity carrier concentration from the acquired relationship such that the electric drive power is vicinal to a minimum for the desired optical output power level; ~~and~~

(c) **forming a semiconductor laminated structure on a substrate, the step including the steps of forming a lower cladding layer over the substrate, forming an active layer over the lower cladding layer, and forming an upper cladding layer over the active layer** ~~**forming the semiconductor laser apparatus**~~ with the upper cladding layer having the impurity carrier concentration set to the value determined by the carrier concentration determining step **(b); and**

(d) forming the semiconductor laser apparatus from the semiconductor laminated structure such that it has a front facet, a back facet, and a cavity length between said facets.

Claim 40 **(original):** A fabrication method for a semiconductor laser apparatus according to claim 39, wherein an active layer forming a cavity with the cavity length has a strain multiple quantum well structure.

Claim 41 (currently amended): A semiconductor laser comprising:

a semiconductor laminated structure having a substrate, a lower cladding layer, an upper cladding layer, an active layer disposed between the lower and upper cladding layers, a first electrode, a second electrode, a front facet to output the laser beam, a back facet, and a cavity length L between the front and back facets, the active layer being configured to generate light such that the apparatus provides optical output power at the front facet in response to a source of electrical power applied to the first and second electrodes, the cavity length L being in the range of approximately 1000 μm to approximately 1800 μm;

a low reflectance coating disposed on the front facet having a reflectivity of less than approximately 4%;

a high reflectance coating disposed on the back facet and having a reflectivity of more than approximately 80%;

a power supply coupled to said electrodes and applying an amount of power which causes the semiconductor laser to operate with an optical output power level P_{OUT} that is

PAGE 8/34 * RCVD AT 3/3/2004 7:11:15 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:4154343947 * DURATION (mm-ss):15-42

maintained **<u>at or above 50 mW and</u>** within a range that is less than or equal to a specified upper bound and greater than or equal to a specified lower bound, the specified upper and lower bounds being based on the cavity length L,

the specified lower bound having a value of 50 mW for cavity lengths between approximately 1000 μm and 1380 μm, a value equal to the quantity (1mW)*[(L-1280μm)/2μm)] for cavity lengths of 1380 μm to 1480 μm, a value equal to the quantity (1mW)*[(L-1260 μm)/2.2μm)] for cavity lengths of 1480 μm to 1700 μm, a value equal to the quantity (2mW)*[(L-1600 μm)/1μm)] for cavity lengths of 1700 μm to 1750 μm, and a value of (3mW)*[(L-1510 μm)/2μm)] for cavity lengths of 1750 μm to approximately 1770 μm, and

the specified upper bound having a value equal to the quantity (2mW)*[(L-950μm)/1μm)] for cavity lengths of approximately 1000 μm to 1050 μm, a value equal to the quantity (2mW)*[(L-750 μm)/3μm)] for cavity lengths of 1050 μm to 1200 μm, a value equal to the quantity (2mW)*[(L-450 μm)/5μm)] for cavity lengths of 1200 μm to 1350 μm, a value equal to the quantity (3mW)*[(L-150 μm)/10μm)] for cavity lengths of 1350 μm to 1450 μm, and a value equal to the quantity 390 mW for cavity lengths of 1450 μm to approximately 1770 μm.

Claim 42 **(original):** The semiconductor laser of claim 41 wherein the amount of electrical potential applied to said electrodes causes the semiconductor laser to operate at an optical output power level P_{OUT} of between approximately 50 mW and approximately 100 mW, and wherein the cavity length is in the range between approximately 1000 μm and approximately {2μm*(P_{OUT}/1mW) +1280 μm}.

Claim 43 **(original):** The semiconductor laser of claim 41 wherein the amount of electrical potential applied to said electrodes causes the semiconductor laser to operate at an optical output power level P_{OUT} of between approximately 100 mW and approximately 200 mW, and wherein the cavity length is in the range between approximately {1μm*(P_{OUT}/2mW)+950 μm} and approximately {2.2μm*(P_{OUT}/1mW)+1260 μm }.

PAGE 9/34 * RCVD AT 3/3/2004 7:11:15 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:4154343947 * DURATION (mm-ss):15-42

Claim 44 **(original):** The semiconductor laser of claim 41 wherein the amount of electrical potential applied to said electrodes causes the semiconductor laser to operate at an optical output power level P_{OUT} of between approximately 200 mW and approximately 300 mW, and wherein the cavity length is in the range between approximately $\{3\mu m^*(P_{OUT}/2mW)+750\ \mu m\}$ and approximately $\{1\mu m^*(P_{OUT}/2mW)+1600\mu m\}$.

Claim 45 **(original):** The semiconductor laser of claim 41 wherein the amount of electrical potential applied to said electrodes causes the semiconductor laser to operate at an optical output power level P_{OUT} of between approximately 300 mW and approximately 360 mW, and wherein the cavity length is in the range between approximately $\{5\mu m^*(P_{OUT}/2mW)+450\mu m\}$ and approximately 1750 μm.

Claim 46 **(original):** The semiconductor laser of claim 41 wherein the amount of electrical potential applied to said electrodes causes the semiconductor laser to operate at an optical output power level P_{OUT} of between approximately 360 mW and approximately 390 mW, and wherein the cavity length is in the range between approximately $\{10\mu m^*(P_{OUT}/3mW)+150\ \mu m\}$ and approximately $\{2\mu m^*(P_{OUT}/3mW)+1510\ \mu m\}$.

Claim 47 **(original):** The semiconductor laser of claim 41 wherein the length L is in the range of approximately 1000 μm to approximately 1100 μm, and wherein an amount of electrical potential applied to said electrodes which causes the semiconductor laser to operate at an optical output power level P_{OUT} of between approximately 50 mW and approximately 100 mW.

Claim 48 **(original):** The semiconductor laser of claim 41 wherein the length L is in the range of approximately 1200 μm to approximately 1600 μm, and wherein an amount of electrical potential applied to said electrodes which causes the semiconductor laser to operate at an optical output power level P_{OUT} of between approximately 200 mW and approximately 300 mW.

PAGE 10/34 * RCVD AT 3/3/2004 7:11:15 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:4154343947 * DURATION (mm-ss):15-42

Claim 49 (currently amended): A semiconductor laser comprising:

a semiconductor laminated structure having a substrate, a lower cladding layer, an upper cladding layer, an active layer disposed between the lower and upper cladding layers, a first electrode, a second electrode, a front facet to output the laser beam, a back facet, and a cavity length L between the front and back facets, the active layer being configured to generate light such that the apparatus provides optical output power at the front facet in response to a source of electrical power applied to the first and second electrodes, the cavity length L being in the range of approximately 1000 μm to approximately 1800 μm;

a low reflectance coating disposed on the front facet having a reflectivity of less than approximately 4%;

a high reflectance coating disposed on the back facet and having a reflectivity of more than approximately 80%;

an optical output power level P_{OUT} maintained **<u>at or above 50 mW and</u>** within a range that is less than or equal to a specified upper bound and greater than or equal to a specified lower bound, the specified upper and lower bounds being based on the cavity length L,

the specified lower bound having a value of 50 mW for cavity lengths between approximately 1000 um and 1380 um, a value equal to the quantity (1mW)*[(L-1280 μm)/2μm)] for cavity lengths of 1380 μm to 1480 μm, a value equal to the quantity (1mW)*[(L-1260 μm)/2.2μm)] for cavity lengths of 1480 μm to 1700 μm, a value equal to the quantity (2mW)*[(L-1600 μm)/1μm)] for cavity lengths of 1700 μm to 1750 μm, and a value of (3mW)*[(L-1510 μm)/2μm)] for cavity lengths of 1750 μm to approximately 1770 μm, and

the specified upper bound having a value equal to the quantity (2mW)*[(L-950 μm)/1μm)] for cavity lengths of approximately 1000 μm to 1050 μm, a value equal to the quantity (2mW)*[(L-750 μm)/3μm)] for cavity lengths of 1050 μm to 1200 μm, a value equal to the quantity (2mW)*[(L-450μm)/5μm)] for cavity lengths of 1200 μm to 1350 μm, a value equal to the quantity (3mW)*[(L-150 μm)/10μm)] for cavity lengths of 1350 μm to 1450 μm, and a value equal to the quantity 390 mW for cavity lengths of 1450 μm to approximately 1770 μm.

PAGE 11/34 * RCVD AT 3/3/2004 7:11:15 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:4154343947 * DURATION (mm-ss):15-42

Claim 50 **(original):** The semiconductor laser of claim 49 wherein the optical output power level P_{OUT} is between approximately 50 mW and approximately 100 mW, and wherein the cavity length is in the range between approximately 1000 μm and approximately {2μm*(P_{OUT}/1mW) +1280 μm}.

Claim 51 **(original):** The semiconductor laser of claim 49 wherein the optical output power level P_{OUT} is between approximately 100 mW and approximately 200 mW, and wherein the cavity length is in the range between approximately {1μm*(P_{OUT}/2mW)+950 μm} and approximately {2.2μm*(P_{OUT}/1mW)+1260μm}.

Claim 52 **(original):** The semiconductor laser of claim 49 wherein the optical output power level P_{OUT} is between approximately 200 mW and approximately 300 mW, and wherein the cavity length is in the range between approximately {3μm*(P_{OUT}/2mW)+750 μm}and approximately {1μm*(P_{OUT}/2mW)+1600μm}.

Claim 53 **(original):** The semiconductor laser of claim 49 wherein the optical output power level P_{OUT} is between approximately 300 mW and approximately 360 mW, and wherein the cavity length is in the range between approximately {5μm*(P_{OUT}/2mW)+450μm} and approximately 1750 μm.

Claim 54 **(original):** The semiconductor laser of claim 49 wherein the optical output power level P_{OUT} is between approximately 360 mW and approximately 390 mW, and wherein the cavity length is in the range between approximately {10μm*(P_{OUT}/3mW)+150 μm} and approximately{2μm*(P_{OUT}/3mW)+1510 μm}.

Claim 55 **(original):** The semiconductor laser of claim 49 wherein the length L is in the range of approximately 1000 μm to approximately 1100 μm, and wherein the optical output power level P_{OUT} is between approximately 50 mW and approximately 100 mW.

Claim 56 **(original):** The semiconductor laser of claim 49 wherein the length L is in the range of approximately 1200 μm to approximately 1600 μm, and wherein the optical output power level P_{OUT} is between approximately 200 mW and approximately 300 mW.

Claim 57 (currently amended): A method of increasing the photoelectric conversion efficiency of a semiconductor laser, the semiconductor laser including a semiconductor laminated structure having a substrate, a lower cladding layer, an upper cladding layer, an active layer disposed between the lower and upper cladding layers, a first electrode, a second electrode, a front facet to output the laser beam, a back facet, and a cavity length L between the front and back facets, the active layer being configured to generate light such that the apparatus provides optical output power at the front facet in response to a source of electrical power applied to the first and second electrodes, the cavity length L being in the range of approximately 1000 μm to approximately 1800 μm, the semiconductor laser further including a low reflectance coating disposed on the front facet having a reflectivity of less than approximately 4%, and a high reflectance coating disposed on the back facet and having a reflectivity of more than approximately 80%, said method comprising the step of:

operating the semiconductor laser at an optical output power level P_{OUT} **<u>at or above 50 mW and in a range that</u>** ~~which~~ is less than or equal to a specified upper bound and which is greater than or equal to a specified lower bound, the specified upper and lower bounds being based on the cavity length L,

the specified lower bound having a value of 50 mW for cavity lengths between approximately 1000 um and 1380 um, a value equal to the quantity (1mW)*[(L-1280μm)/2μm)] for cavity lengths of 1380 μm to 1480 μm, a value equal to the quantity (1mW)*[(L-1260 μm)/2.2μm)] for cavity lengths of 1480 μm to 1700 μm, a value equal to the quantity (2mW)*[(L-1600 μm)/1μm)] for cavity lengths of 1700 μm to 1750 μm, and a value of (3mW)*[(L-1510 μm)/2μm)] for cavity lengths of 1750 μm to approximately 1770 μm, and

the specified upper bound having a value equal to the quantity (2mW)*[(L-950μm)/1μm)] for cavity lengths of approximately 1000 μm to 1050 μm, a value equal to the quantity (2mW)*[(L-750 μm)/3μm)] for cavity lengths of 1050 μm to 1200 μm, a value equal to the quantity (2mW)*[(L-450 μm)/5μm)] for cavity lengths of 1200 μm to 1350 μm, a value equal to the quantity (3mW)*[(L-150 μm)/10μm)] for cavity lengths of 1350 μm to 1450 μm, and a value equal to the quantity 390 mW for cavity lengths of 1450 μm to approximately 1770 μm.

PAGE 13/34 * RCVD AT 3/3/2004 7:11:15 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:4154343947 * DURATION (mm-ss):15-42

Claim 58 **(original):** The method of claim 57 wherein the laser is operated at an optical output power level P_{OUT} which is between approximately 50 mW and approximately 100 mW, and wherein the cavity length is in the range between approximately 1000 μm and approximately $\{2\mu m*(P_{OUT}/1mW) + 1280\ \mu m\}$.

Claim 59 **(original):** The method of claim 57 wherein the laser is operated at an optical output power level P_{OUT} which is between approximately 100 mW and approximately 200 mW, and wherein the cavity length is in the range between approximately $\{1\mu m*(P_{OUT}/2mW)+950\ \mu m\}$ and approximately $\{2.2\mu m*(P_{OUT}/1mW)+1260\ \mu m\}$.

Claim 60 **(original):** The method of claim 57 wherein the laser is operated at an optical output power level P_{OUT} which is between approximately 200 mW and approximately 300 mW, and wherein the cavity length is in the range between approximately $\{3\mu m*(P_{OUT}/2mW)+750\ \mu m\}$ and approximately $\{1\mu m*(P_{OUT}/2mW)+1600\mu m\}$.

Claim 61 **(original):** The method of claim 57 wherein the laser is operated at an optical output power level P_{OUT} which is between approximately 300 mW and approximately 360 mW, and wherein the cavity length is in the range between approximately $\{5\mu m*(P_{OUT}/2mW)+450\mu m\}$ and approximately 1750 μm.

Claim 62 **(original):** The method of claim 57 wherein the laser is operated at an optical output power level P_{OUT} which is between approximately 360 mW and approximately 390 mW, and wherein the cavity length is in the range between approximately $\{10\mu m*(P_{OUT}/3mW)+150\ \mu m\}$ and approximately $\{2\mu m*(P_{OUT}/3mW)+1510\ \mu m\}$.

Claim 63 **(original):** The method of claim 57 wherein the length L is in the range of approximately 1000 μm to approximately 1100 μm, and wherein the optical output power level P_{OUT} is between approximately 50 mW and approximately 100 mW.

Claim 64 **(original):** The method of claim 57 wherein the length L is in the range of approximately 1200 μm to approximately 1600 μm, and wherein the optical output power level P_{OUT} is between approximately 200 mW and approximately 300 mW.

PAGE 14/34 * RCVD AT 3/3/2004 7:11:15 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:4154343947 * DURATION (mm-ss):15-42

Claim 65 (currently amended): A method of forming a semiconductor laser to provide reduced power consumption or increased photoelectric conversion efficiency for a selected output power level P_{OUT} in the range between approximately 50 mW and approximately 400 mW, ~~the semiconductor laser including a semiconductor laminated structure having a substrate, a lower cladding layer, an upper cladding layer, an active layer disposed between the lower and upper cladding layers, a first electrode, a second electrode, a front facet to output the laser beam, a back facet, and a cavity length between the front and back facets, the active layer being configured to generate light such that the apparatus provides optical output power at the front facet in response to a source of electrical power applied to the first and second electrodes, the semiconductor laser further including a low reflectance coating disposed on the front facet having a reflectivity of less than approximately 4%, and a high reflectance coating disposed on the back facet and having a reflectivity of more than approximately 80%,~~ said method comprising:

(a) forming a semiconductor laminated structure on a substrate, the step including the steps of forming a lower cladding layer over the substrate, forming an active layer over the lower cladding layer, forming an upper cladding layer over the active layer, and forming a first electrode on the substrate and a second electrode over the upper cladding layer;

(b) forming the semiconductor laser apparatus from the semiconductor laminated structure such that the apparatus has a front facet, a back facet, and a cavity length between said facets, the active layer being configured to generate light such that the semiconductor laser provides optical output power at the front facet in response to a source of electrical power applied to the first and second electrodes;

(c) forming a low reflectance coating on the front facet having a reflectivity of less than approximately 4%; and

(d) forming a high reflectance coating on the back facet having a reflectivity of more than approximately 80%; and

wherein step (b) comprises the step of selecting the cavity length to be at or greater than approximately 1000 μm and within one of [[four]] five ranges depending upon the value of the selected output power level P_{OUT},

PAGE 15/34 * RCVD AT 3/3/2004 7:11:15 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:4154343947 * DURATION (mm-ss):15-42

the first range being between approximately 1000 μm and approximately $\{2\mu m*(P_{OUT}/1mW) +1280\ \mu m\}$ for values of P_{OUT} between approximately 50 mW and approximately 100 mW,

the second range being between approximately $\{1\mu m*(P_{OUT}/2mW)+950\mu m\}$ and approximately $\{2.2\mu m*(P_{OUT}/1mW) +1260\ \mu m\}$ for values of P_{OUT} between approximately 100 mW and approximately 200 mW,

the third range being between approximately $\{3\mu m*(P_{OUT}/2mW)+750\mu m\}$ and approximately $\{1\mu m*(P_{OUT}/2mW) +1600\ \mu m\}$ for values of P_{OUT} between approximately 200 mW and approximately 300 mW, and

the fourth range being between approximately $\{5\mu m*(P_{OUT}/2mW)+450\ \mu m\}$ and approximately 1750 μm for values of P_{OUT} between approximately 300 mW and approximately 360 mW, and

the fifth range being between approximately $\{10\mu m*(P_{OUT}/3mW)+150\ \mu m\}$ and approximately $\{2\mu m*(P_{OUT}/3mW) +1510\ \mu m\}$ for values of P_{OUT} between approximately 360 mW and approximately 390 mW.

Claim 66 **(original):** The method of claim 65 wherein the selected optical output power P_{OUT} is between approximately 50 mW and approximately 100 mW, and wherein the cavity length is in the range between approximately 1000 μm and approximately $\{2\mu m*(P_{OUT}/1mW) +1280\ \mu m\}$.

Claim 67 **(original):** The method of claim 65 wherein the selected optical output power P_{OUT} is between approximately 100 mW and approximately 200 mW, and wherein the cavity length is in the range between approximately $\{1\mu m*(P_{OUT}/2mW)+950\ \mu m\}$ and approximately $\{2.2\mu m*(P_{OUT}/1mW)+1260\mu m\}$.

Claim 68 **(original):** The method of claim 65 wherein the selected optical output power P_{OUT} is between approximately 200 mW and approximately 300 mW, and wherein the cavity length is in the range between approximately $\{3\mu m*(P_{OUT}/2mW)+750\ \mu m\}$ and approximately $\{1\mu m*(P_{OUT}/2mW)+1600\ \mu m\}$.

PAGE 16/34 * RCVD AT 3/3/2004 7:11:15 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:4154343947 * DURATION (mm-ss):15-42

Claim 69 **(original):** The method of claim 65 wherein the selected optical output power P_{OUT} is between approximately 300 mW and approximately 360 mW, and wherein the cavity length is in the range between approximately $\{5\mu m*(P_{OUT}/2mW)+450\mu m\}$ and approximately 1750 μm. .

Claim 70 **(original):** The method of claim 65 wherein the selected optical output power P_{OUT} is between approximately 360 mW and approximately 390 mW, and wherein the cavity length is in the range between approximately $\{10\mu m*(P_{OUT}/3mW)+150\ \mu m\}$ and approximately $\{2\mu m*(P_{OUT}/3mW)+1510\ \mu m\}$.

Claim 71 **(original):** The method of claim 65 wherein the selected optical output power level P_{OUT} is between approximately 50 mW and approximately 100 mW, and wherein the length L is selected in the range of approximately 1000 μm to approximately 1100 μm.

Claim 72 **(original):** The method of claim 65 wherein the selected optical output power level P_{OUT} is between approximately 200 mW and approximately 300 mW, and wherein the length L is in the range of approximately 1200 μm to approximately 1600 μm.

Claim 73 **(previously presented):** The fabrication method of claim 39 wherein said step (a) additionally acquires the relationship of the electric drive power as a function of the cavity length;

wherein said step (b) determines values of the cavity length and the impurity carrier concentration from the acquired relationship such that the electric driving power is vicinal to a minimum for the desired optical output power; and

wherein said step (c) forms the semiconductor laser apparatus with values for the cavity length and the impurity carrier concentration that are determined by step (b).

Claim 74 **(previously presented):** The method of claim 31, wherein the active layer is configured to generate light along at least 1000 microns of the length of the cavity.

Claim 75 **(previously presented):** The method of claim 33, wherein the active layer is configured to generate light along at least 1000 microns of the cavity length.

Claim 76 **(previously presented):** The method of claim 39, wherein the active layer is configured to generate light along at least 1000 microns of the length of the cavity.

Claim 77 **(previously presented):** The semiconductor laser of claim 41, wherein the active layer is configured to generate light along at least 1000 microns of the length of the cavity.

Claim 78 **(previously presented):** The semiconductor laser of claim 49, wherein the active layer is configured to generate light along at least 1000 microns of the length of the cavity.

Claim 79 **(previously presented):** The method of claim 57, wherein the active layer is configured to generate light along at least 1000 microns of the length of the cavity.

Claim 80 **(previously presented):** The method of claim 65, wherein the active layer is configured to generate light along at least 1000 microns of the length of the cavity.

Claim 81 **(new):** The method of Claim 31 further comprising the steps of:

forming a low reflectance coating on the front facet having a reflectivity of less than approximately 4%; and

forming a high reflectance coating on the back facet having a reflectivity of more than approximately 80%.

Claim 82 **(new):** The method of Claim 33 further comprising the steps of:

forming a low reflectance coating on the front facet having a reflectivity of less than approximately 4%; and

forming a high reflectance coating on the back facet having a reflectivity of more than approximately 80%.

Claim 83 **(new):** The method of Claim 39 further comprising the steps of:

forming a low reflectance coating on the front facet having a reflectivity of less than approximately 4%; and

forming a high reflectance coating on the back facet having a reflectivity of more than approximately 80%.

PAGE 18/34 * RCVD AT 3/3/2004 7:11:15 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-1/0 * DNIS:8729306 * CSID:4154343947 * DURATION (mm-ss):15-42